

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A solid component of catalyst for (co)polymerization of ethylene, comprising titanium, magnesium, chlorine, an organo-oxygenated protic compound D_p, and a neutral electron-donor aprotic compound D which is an ether, in the following molar ratio ranges:

Mg/Ti = 1.0-50; D/Ti = 1.0-15;

Cl/Ti = 6.0-100; D_p/D = 0.05-3,

and additionally comprising an inert granular solid, in a quantity ranging from 10 to 90% by weight with respect to the total weight of the solid component, wherein the solid component is prepared by a process comprising in succession:

(a) forming of a mixture and dissolution, in aprotic electron-donor compound D, of a magnesium chloride and a titanium compound having formula (I):



and adding an inert granular solid,

wherein each R³ represents a hydrocarbyl or acyl radical having from 1 to 15 carbon atoms,

each X is selected from the group consisting of chlorine, bromine and iodine; v is 3 or 4, and represents an oxidation state of titanium,

a is a number ranging from 0 to v, with a molar ratio between magnesium and titanium ranging from 1/1 to 50/1,

(b) partially separating the compound D from said mixture prepared in (a) until a residue is obtained, solid at room temperature, wherein the D/Ti ratio ranges from 1.5 to 40,

(c) forming a suspension of said solid residue in a liquid hydrocarbon medium,

(d) adding to said suspension of an organo-oxygenated protic compound D_p , in a quantity that the molar ratio D_p/D ranges from 0.1 to 1.2 and maintaining the mixture for a period varying from 5 minutes to 5 hours.

Claim 2 (Canceled).

Claim 3 (Previously Presented): The solid component according to claim 1, wherein said inert granular solid is in a quantity ranging from 25 to 50% by weight.

Claim 4 (Previously Presented): The solid component according to claim 1, wherein said inert granular solid is selected from the group consisting of: silica, titania, silico-aluminates, calcium carbonate and magnesium chloride; and the average size of the inert granule solid is from 10 μm to 300 μm .

Claim 5 (Previously Presented): The solid component according to claim 4, wherein said inert granular solid comprises microspheroidal silica having an average diameter ranging from 20 to 100 μm , a BET surface area ranging from 150 to 400 m^2/g , a total porosity equal or higher than 80% and an average pore radius of 50 to 200 \AA .

Claim 6 (Previously Presented): The solid component according to claim 1, wherein the molar ratio ranges are:

$$\begin{array}{ll} \text{Mg/Ti} = 1.5-10; & \text{D/Ti} = 3.0-8.0; \\ \text{Cl/Ti} = 10-25; & \text{D}_p/\text{D} = 0.1-2.0. \end{array}$$

Claim 7 (Previously Presented): The solid component according to claim 1, wherein said ratio D_p/D ranges from 0.2 to 1.0.

Claim 8 (Previously Presented): The solid component according to claim 1, wherein said organo-oxygenated protic compound D_p comprises a compound having following formula (II):



wherein:

R is an aliphatic, cyclo-aliphatic or aromatic radical, optionally fluorinated, containing from 1 to 30 carbon atoms,

A is one of divalent groups having the formula CR^1R^2 , CO , SCO and SO , wherein each R^1 and R^2 is independently hydrogen or an aliphatic or aromatic group having from 1 to 10 carbon atoms;

m is 0 or 1.

Claim 9 (Previously Presented): The solid component according to claim 1, wherein said organo-oxygenated protic compound D_p is selected from the group consisting of aliphatic or aromatic alcohols and organic acids, having from 2 to 10 carbon atoms.

Claim 10 (Canceled).

Claim 11 (Currently Amended): The solid component according to claim 1, wherein said electron-donor compound D is ~~at least one selected from the group consisting of ketones, ethers, esters, amines, amides, thioethers, and xanthates, linear or a cyclic, and aliphatic or aromatic, having from 4 to 10 carbon atoms ether.~~

Claim 12 (Currently Amended): The solid component according to claim [[10]] 1, wherein said compound D is selected from the group consisting of dibutyl ether, dihexyl ether, ~~methyl~~~~ethyl~~ ketone, ~~diisobutyl~~ ketone, tetrahydrofuran, dioxane, ~~ethyl~~ acetate, and butyrolactone.

Claim 13 (Previously Presented): The solid component according to claim 1, wherein said titanium is present in a quantity ranging from 1 to 10% by weight.

Claim 14 (Withdrawn): A process for preparation of the solid component according to claim 1, comprising in succession: (a) forming of a mixture and dissolution, in aprotic electron-donor compound D, of a magnesium chloride and a titanium compound having formula (I):



adding an inert granular solid,

wherein each R^3 represents a hydrocarbyl or acyl radical having from 1 to 15 carbon atoms,

each X is selected from the group consisting of chlorine, bromine and iodine; v is 3 or 4, and represents an oxidation state of titanium,

a is a number ranging from 0 to v, with a molar ratio between magnesium and titanium ranging from 1/1 to 50/1;

- (b) partially separating the compound D from said mixture prepared in (a) until a residue is obtained, solid at room temperature, wherein the D/Ti ratio ranges from 1.5 to 40,
- (c) forming a suspension of said solid residue in a liquid hydrocarbon medium,

(d) adding to said suspension of an organo-oxygenated protic compound D_p , in a quantity that the molar ratio D_p/D ranges from 0.1 to 1.2 and maintaining the mixture for a period varying from 5 minutes to 5 hours.

Claim 15 (Canceled).

Claim 16 (Withdrawn): The process according to claim 15, wherein said granular solid is selected from the group consisting of: silica, titania, silico-aluminates, calcium carbonate, and magnesium chloride; the granular solid has an average granule size ranging from 10 μm to 300 μm .

Claim 17 (Withdrawn): The process according to claim 15, wherein said inert granular solid has microspheroidal silica having an average diameter ranging from 20 to 100 μm , a BET surface area ranging from 150 to 400 m^2/g , a total porosity equal or higher than 80% and an average pore radius of 50 to 200 \AA .

Claim 18 (Withdrawn): The process according to claim 14, wherein said titanium compound having formula (I) is selected from the group consisting of titanium chlorides, bromides, alcoholates and carboxylates.

Claim 19 (Withdrawn): The process according to claim 14, wherein said compound having formula (I) in (a) is titanium trichloride.

Claim 20 (Withdrawn): The process according to claim 14, wherein said magnesium chloride is in amorphous form.

Claim 21 (Withdrawn): The process according to claim 14, wherein, in said (a), the atomic ratio between magnesium and titanium ranges from 1.0 to 50 and the ratio (D moles)/(Ti atoms) ranges from 5 to 100.

Claim 22 (Withdrawn): The process according to claim 14, wherein said (a) is carried out at a temperature ranging from room temperature to a boiling point of the donor compound D, until at least 80% of said compounds of Ti and Mg are dissolved.

Claim 23 (Withdrawn): The process according to claim 14, wherein said (b) is carried out by evaporation.

Claim 24 (Withdrawn): The process according to claim 14, wherein the molar ratio D_p/D in said (d) ranges from 0.2 to 1.2.

Claim 25 (Withdrawn): The process according to claim 14, wherein said (d) is carried out by heating the mixture to a temperature ranging from 40 to 100°C, for a period of time varying from 5 minutes to 5 hours.

Claim 26 (Withdrawn): The process according to claim 25, wherein the reaction mixture in said (d) is heated to a temperature of 60 to 80°C, for a period ranging from 5 to 60 minutes.

Claim 27 (Withdrawn): A process for preparation of a solid component according to claim 1, comprising reacting in an inert liquid medium, a solid precursor comprising titanium,

magnesium, chlorine, an aprotic electron-donor compound D and optionally an inert granular solid, in following molar ratios:

$$\text{Mg/Ti} = 1-50; \quad \text{D/Ti} = 2.0-20; \quad \text{Cl/Ti} = 6-100;$$

and wherein said inert granular solid is in a quantity ranging from 0 to 95%, with protic organo-oxygenated compound D_p, in a quantity that the molar ratio D_p/D ranges from 0.1 to 1.2, until equilibrium is reached.

Claim 28 (Withdrawn): The process according to claim 27, wherein said molar ratios are:

$$\text{Mg/Ti} = 1.5-10; \quad \text{D/Ti} = 4.0-12; \quad \text{Cl/Ti} = 10-30$$

and said inert granular solid is in a quantity ranging from 20 to 60% by weight with respect to the total weight of the precursor.

Claim 29 (Withdrawn): The process according to claim 27, wherein the molar ratio D_p/D ranges from 0.2 to 1.2.

Claim 30 (Withdrawn): The process according to claim 27, wherein said reaction is carried out at a temperature ranging from 40 to 100°C, for a period varying from 5 minutes to 5 hours.

Claim 31 (Withdrawn): The process according to claim 30, wherein said reaction is carried out at a temperature ranging from 60 to 80°C, for a period of 5 to 60 minutes.

Claim 32 (Withdrawn): A catalyst for (co)polymerization of ethylene, wherein the catalyst is obtained by a process comprising reaction of said solid component according to

claim 1, with a co-catalyst comprising a hydrocarbyl compound of a metal selected from the group consisting of Al, Ga, Mg, Zn and Li, wherein the atomic ratio between the metal in the co-catalyst and titanium in the solid component of catalyst ranges from 10:1 to 500:1.

Claim 33 (Withdrawn): The catalyst according to claim 32, wherein the atomic ratio between the metal in the co-catalyst and titanium in the solid component of catalyst ranges from 50:1 to 200:1.

Claim 34 (Withdrawn): The catalyst according to claim 32, comprising titanium, magnesium, aluminum and chlorine, wherein said co-catalyst comprises an alkylic organometallic compound of aluminum.

Claim 35 (Withdrawn): The catalyst according to claim 34, wherein said organometallic compound of aluminum is at least one of aluminum tri-alkyls comprising from 1 to 10 carbon atoms in each alkyl group.

Claim 36 (Withdrawn): The catalyst according to claim 32, wherein said solid component is activated before contact with said co-catalyst, by reaction with an aluminum alkyl or alkyl chloride represented by following general formula (III):



wherein: R' is a linear or branched alkyl radical containing from 1 to 20 carbon atoms, X is one of H and Cl and n is a decimal number having a value ranging from 1 to 3; and an Al/(D+D_p) ratio between the aluminium moles in said compound having formula (III) and the total of D and D_p moles in said solid component, ranges from 0.1 to 1.5.

Claim 37 (Withdrawn): The catalyst according to claim 36, wherein said R' in formula (III) is a linear or branched aliphatic radical, having from 2 to 8 carbon atoms.

Claim 38 (Withdrawn): The catalyst according to claim 37, wherein said Al/(D+D_p) ratio ranges from 0.2 to 1.3.

Claim 39 (Withdrawn): The catalyst according to claim 36, wherein said solid component is activated by a first reaction with an aluminum trialkyl (n = 3 in formula (III)), and successively in a second reaction with an aluminum dialkyl chloride (n = 2, X = Cl, in formula (III)), in a quantity that the overall molar ratio Al/(D+D_p) ranges from 0.1 to 1.3.

Claim 40 (Withdrawn): The catalyst according to claim 38, wherein, in said first reaction, the molar ratio AlR₃/(D+D_p) ranges from 0.1 to 0.4 and, in the second reaction, the molar ratio AlR₂Cl/(D+D_p) ranges from 0.2 to 0.6.

Claim 41 (Withdrawn): A process for (co)polymerization of ethylene, comprising reacting ethylene and optionally at least one alpha-olefin, under a polymerization condition, in the presence of said catalyst according to claim 32.

Claim 42 (Withdrawn): The process according to claim 41, comprising carrying out a fluid-bed method, wherein a gaseous stream of ethylene and optional alpha-olefin is reacted in the presence of a quantity of catalyst, wherein a titanium concentration ranges from 1 to 5 ppm by weight with respect to a consolidated production, at a temperature ranging from 70 to 115°C, and at a pressure ranging from 500 to 1000 kPa.

Claim 43 (Withdrawn): The process according to claim 42, wherein said stream is introduced from the bottom of the polymerization reactor, partially comprising a stream in liquid form.

Claim 44 (Withdrawn): The process according to claim 42, wherein said gaseous stream comprises ethylene and alpha-olefin.

Claim 45 (Withdrawn): The process according to claim 41, wherein the molar ratio with ethylene ranges from 0.1 to 1.0.

Claim 46 (Withdrawn): The process according to claim 41, wherein said α -olefin is one of 1-butene, 1-hexene and 1-octene and is in a quantity that the molar ratio with ethylene ranges from 0.1 to 0.4.

Claim 47 (Withdrawn): The process according to claim 41, comprising obtaining linear polyethylene having a density ranging from 0.915 to 0.950 g/ml.

Claim 48 (Withdrawn): The process according to claim 42, comprising obtaining linear polyethylene having a density lower than 0.915 g/ml and copolymerizing, in gas phase, a gaseous mixture comprising ethylene and at least one alpha-olefin having from 4 to 10 carbon atoms.

Claim 49 (Withdrawn): The process according to claim 48, wherein the gaseous mixture of ethylene and the at least one alpha-olefin is reacted in the presence of a sufficient

quantity of catalyst, at a temperature ranging from 70 to 95°C, and a pressure ranging from 500 to 1000 kPa.

Claim 50 (Withdrawn): The process according to claim 48, wherein said alpha-olefin is one of 1-butene, 1-hexene and 1-octene, and is in a quantity that the molar ratio with respect to ethylene ranges from 0.1 to 0.4.

Claim 51 (Withdrawn): The process according to claim 41, wherein said catalyst is formed *in situ* inside the reactor.

Claim 52 (Withdrawn): The process according to claim 41, wherein said linear polyethylene has a weight average molecular weight M_w ranging from 20,000 to 500,000 and a MWD (M_w/M_n) distribution ranging from 2.5 to 4.

Claim 53 (Previously Presented): The solid component according to claim 1, wherein said granular solid is selected from the group consisting of: silica, titania, silico-aluminates, calcium carbonate, and magnesium chloride; the granular solid has an average granule size ranging from 10 μm to 300 μm .

Claim 54 (Previously Presented): The solid component according to claim 1, wherein said titanium compound having formula (I) is selected from the group consisting of titanium chlorides, bromides, alcoholates and carboxylates.

Claim 55 (Previously Presented): The solid component according to claim 1, wherein said compound having formula (I) in (a) is titanium trichloride.

Claim 56 (Previously Presented): The solid component according to claim 1, wherein said magnesium chloride is in amorphous form.

Claim 57 (Previously Presented): The solid component according to claim 1, wherein, in said (a), the atomic ratio between magnesium and titanium ranges from 1.0 to 50 and the ratio (D moles)/(Ti atoms) ranges from 5 to 100.

Claim 58 (Previously Presented): The solid component according to claim 1, wherein said (a) is carried out at a temperature ranging from room temperature to a boiling point of the donor compound D, until at least 80% of said compounds of Ti and Mg are dissolved.

Claim 59 (Previously Presented): The solid component according to claim 1, wherein said (b) is carried out by evaporation.

Claim 60 (Previously Presented): The solid component according to claim 1, wherein the molar ratio D_p/D in said (d) ranges from 0.2 to 1.2.

Claim 61 (Previously Presented): The solid component according to claim 1, wherein said (d) is carried out by heating the mixture to a temperature ranging from 40 to 100°C, for a period of time varying from 5 minutes to 5 hours.

Claim 62 (Previously Presented): The solid component according to claim 61, wherein the reaction mixture in said (d) is heated to a temperature of 60 to 80°C, for a period ranging from 5 to 60 minutes.